CLAIMS

What is claimed is:

1. A method of measuring noise at one or more base stations in a mobile communication system, comprising:

defining a periodic silence period for at least one carrier that is independent of reverse link channel frame boundaries;

transmitting silence parameters that define the periodic silence period to mobile stations communicating with the base stations, wherein the mobile stations stop transmitting during the periodic silence period; and

measuring the noise at each base station during the periodic silence periods.

2. The method of claim 1 wherein the silence parameters include a frequency parameter that indicates the frequency of the silence period, a duration parameter that indicates the duration of the silence period, and a time reference parameter that provides an absolute time reference for synchronizing silence periods for non-synchronous reverse link channels.

3. The method of claim 1 wherein the periodic silence period encompasses portions of at least two consecutive reverse link frames.

4. The method of claim 1 wherein measuring the noise at each base station during the periodic silence periods comprises measuring the power of the noise during the periodic silence period.

5. The method of claim 1 wherein the noise includes adjacent carrier interference.

6. The method of claim 1 wherein the mobile communication system is a multi-carrier system and wherein the periodic silence period is defined for at least one carrier.

7. The method of claim 6 further comprising:

assigning a first group of mobile stations to a first carrier with a periodic silence period; and

assigning a second group of mobile stations to a second carrier without a periodic silence period.

8. The method of claim 6 wherein the periodic silence period is defined for a plurality of carriers.

9. The method of claim 8 wherein the periodic silence period is synchronized for two or more carriers.

10. The method of claim 6 wherein the periodic silence period is defined for all carriers.

11. The method of claim 10 wherein the periodic silence period is synchronized for all carriers.

12. The method of claim 1 further comprising causing legacy mobile stations that do not recognize silence periods to stop transmitting on the reverse link during a silence period.

13. The method of claim 12 wherein causing legacy mobile stations that do not recognize silence periods to stop transmitting on the reverse link during a silence period comprises directing the legacy mobile stations to a dummy carrier during the silence period.

14. The method of claim 12 wherein causing legacy mobile stations that do not recognize silence periods to stop transmitting on the reverse link during a silence period comprises directing the legacy mobile stations to perform a candidate frequency search on a different carrier during the silence period.

15. The method of claim 1 wherein the duration of the silence period is at least one frame.

16. The method of claim 1 wherein the duration of the silence period is less than one frame.

17. The method of claim 1 further comprising suspending transmission of power control commands on a forward link power control channel during the silence period.

18. A base station in a mobile communication system comprising:

a controller to define a periodic silence period for at least one carrier that is independent of reverse link channel frame boundaries

a transmitter to transmit silence parameters that define the periodic silence period to mobile stations; and

a receiver including a measurement circuit to measure noise during the periodic silence period.

19. The base station of claim 18 wherein the silence parameters include a frequency parameter that indicates the frequency of the silence period, a duration parameter that indicates the duration of the silence period, and a time reference parameter that provides an absolute time reference for synchronizing silence periods for non-synchronous reverse link channels.

20. The base station of claim 18 wherein the periodic silence period encompasses portions of at least two consecutive frames.

21. The base station of claim 18 wherein the receiver measures the power of the noise during the periodic silence period.

22. The base station of claim 18 wherein the noise includes adjacent carrier interference.

23. The base station of claim 18 wherein the mobile communication system is a multi-carrier system and wherein the controller defines a periodic silence period for at least one carrier.

24. The base station of claim 23 wherein the controller is further operative to:

assigning a first group of mobile stations to a first carrier with a periodic silence period; and

assigning a second group of mobile stations to a second carrier without a periodic silence period.

25. The base station of claim 23 wherein the periodic silence period is defined for a plurality of carriers.

26. The base station of claim 25 wherein the periodic silence period is synchronized for two or more carriers.

27. The base station of claim 23 wherein the periodic silence period is defined for all carriers.

28. The base station of claim 18 wherein the periodic silence period is synchronized for all carriers.

29. The base station of claim 18 further wherein the controller is operative to cause legacy mobile stations that do not recognize silence periods to stop transmitting on the reverse link during a silence period.

30. The base station of claim 29 wherein the controller directs the legacy mobile stations to a dummy carrier during the silence period.

31. The base station of claim 29 wherein the controller instructs the legacy mobile stations to perform a candidate frequency search on a different carrier during the silence period.

32. The base station of claim 18 wherein the duration of the silence period is at least one frame.

33. The base station of claim 18 wherein the duration of the silence period is less than one frame.

34. The base station of claim 18 wherein the controller suspends transmission of power control commands on a forward link power control channel during the silence period.

35. A mobile station in a mobile communication network comprising:

a transmitter to transmit signals to one or more base stations on one or more revere link channels;

a receiver to receive from a base station silence parameters that define a periodic silence period that is independent of reverse link channel frame boundaries; and

a controller operatively connected to the transmitter and the receiver, said controller operative to shut off the transmitter during the periodic silence period.

36. The mobile station of claim 35 wherein the controller is further operative to gradually transmit power at the beginning of the periodic silence period, and to gradually increase transmit power at the end of the silence period.

37. The mobile station of claim 35 wherein the silence parameters include a frequency parameter that indicates the frequency of the silence period, a duration parameter that indicates the duration of the silence period, and a time reference parameter that provides an absolute time reference for synchronizing silence periods for non-synchronous reverse link channels.

38. The mobile station of claim 35 wherein the periodic silence periods encompass portions of at least two consecutive frames.

39. The mobile station of claim 35 wherein the controller is programmed to ignore a forward power control channel during the silence period.

40. The mobile station of claim 35 wherein the duration of the silence period is at least one frame.

41. The mobile station of claim 35 wherein the duration of the silence period is less than one frame.

42. A method of measuring noise at one or more base stations in a mobile communication system, comprising:

defining non-synchronous and overlapping silence periods for at least two reverse link channels with different frame timing;

transmitting silence parameters that define the periodic silence periods to the mobile stations, wherein the mobile stations stop transmitting on the reverse link channels during the periodic silence periods; and

measuring the noise at each base station during the overlap in the periodic silence periods.

43. The method of claim 42 wherein the periodic silence periods encompass portions of at least two consecutive reverse link frames.

44. The method of claim 42 wherein measuring the noise at each base station during the periodic silence periods comprises measuring the power of the noise during the periodic silence period.

45. The method of claim 42 wherein the noise includes adjacent carrier interference.

46. The method of claim 42 wherein the mobile communication system is a multi-carrier system and wherein the periodic silence periods are defined for all reverse link channels on at least one carrier.

47. The method of claim 42 wherein the duration of the silence period is at least one frame.

48. The method of claim 42 wherein the duration of the silence period is less than one frame.

47. A transmission method to facilitate measurement of background noise in a mobile communication system, comprising:

defining a periodic silence period for at least one carrier that is independent of reverse link channel frame boundaries;

determining whether a frame overlaps a silence period;

controlling a transmitter responsive to the determination whether a frame overlaps a silence period.

48. The method of claim 47 wherein controlling a transmitter responsive to the determination whether a frame overlaps a silence period comprises transmitting a first part of the frame; suspending transmission of the frame during the silence period, and transmitting a second part of the frame following the silence period.

49. The method of claim 47 wherein controlling a transmitter responsive to the determination whether a frame overlaps a silence period comprises delaying transmission of a frame if the frame overlaps a silence period, and transmitting the delayed frame following the silence period.

50. The method of claim 47 wherein controlling a transmitter responsive to the determination whether a frame overlaps a silence period comprises erasing a frame if the frame overlaps a silence period.

51. A communication apparatus for a wireless communication network comprising:

a transmitter to transmit signals on a channel that is divided into a plurality of frames; and

a controller operatively connected to the transmitter, said controller operative to:

determine whether a frame overlaps a silence period, wherein the silence period is independent of frame boundaries; and

to control the transmitter responsive to the determination whether a frame overlaps the silence period.

52. The communication apparatus of claim 51 wherein the controller causes the transmitter to:

transmit a first part of the frame;

suspend transmission of the frame during the silence period; and

resume transmission and transmit a second part of the frame following the silence period.

53. The communication apparatus of claim 52 wherein the controller causes the transmitter to delay transmission of a frame that overlaps with the silence period, and to transmit the delayed frame following the silence period.

54. The communication apparatus of claim 52 wherein the controller erases a frame that overlaps with the silence period.